IN THE CLAIMS

The following listing of the claims is provided in accordance with 37 C.F.R. §1.121:

1. (currently amended) A method for imaging anisotropic media comprising:

selecting multiple points within the anisotropic media, which is to be imaged~~;~~, and determining an acoustic path between each selected point in the anisotropic media and a receiver position on the surface of the anisotropic media;

calculating an acoustic wave velocity at the ~~all necessary~~ selected points~~;~~, and determining an acoustic path length based on each selected point in the anisotropic media and the receiver position;

determining a time delay for each acoustic wave between each ~~image~~ selected point and the receiver position on the surface of the anisotropic media;

calculating a sum for each ~~point~~ selected point based on the ~~appropriate~~ acoustic wave velocities, ~~and~~ the acoustic path lengths, and the time delays; and

generating an image of the anisotropic media using the ~~coherent~~ sums generated for each ~~said image~~ selected point ~~selected~~.

2. (original) The method of Claim 1, wherein the determining the acoustic path between each selected point in the anisotropic media and a receiver position on the surface of the anisotropic media comprises postulating a direct path for the wave.

3. (original) The method of Claim 1, wherein the determining the acoustic path between each selected point in the anisotropic media and a receiver position further comprises adjusting the wave normal to the postulated path using a least squares minimization routine such that the wave normal is adjusted to a point where the ray trajectory intersects the sensing surface at a point where the receiver location is desired.

4. (original) The method of Claim 1, wherein the calculating the acoustic wave velocity in any direction is accomplished by solving a Christoffel equation.

5. (original) The method of Claim 1, wherein the calculating the acoustic wave velocity further comprises determining phase and group velocities, and further wherein the phase and group velocities are determined by a knowledge of fundamental material properties of the anisotropic media.

6. (currently amended) The method of Claim 5, wherein the phase and group velocities in the anisotropic media are determined from ~~engine~~ engineering drawings used to design and manufacture parts.

7. (original) The method of Claim 1, wherein the calculating the acoustic wave velocity is accomplished by further determining the beam skew.

8. (original) The method of Claim 1, wherein the beam skew may be determined by a localized form of Snell's law, a variational calculus formulation based on Fermat's principle, or a full field finite difference model that tracks the wavefronts associated with each mode of propagation.

9. (original) The method of Claim 1, wherein the calculating a sum involves calculating a coherent sum.

10. (original) The method of Claim 1, wherein the calculating a sum involves calculating an incoherent sum.

11. (original) The method of Claim 1, wherein the calculating a sum involves calculating a partially coherent sum.

12. (currently amended) A method for imaging anisotropic media comprising:

slicing the anisotropic media;

irradiating the anisotropic media with a point acoustic source;

scanning the anisotropic media with a receiver to map out a sound field;

determining [a] time ~~delay~~ delays in an acoustic wave from the sound field, the time delays being based upon the acoustic paths between points in isotropic materials within the anisotropic media and a receiver position; and

incorporating the time ~~delay~~ delays into an algorithm to provide enhanced resolution and sensitivity for [the] an image of the anisotropic media.

13. (currently amended) The method of Claim 12, wherein the algorithm is represented by the equations (1):

$$I(x_i, y_i, z_i) = \sum_j U(x_j, y_j, z_j, \Delta t_{ij}) \qquad (1)$$

where Δt_{ij} is the round trip time delay for sound propagation from the observation point (x_i, y_i, z_i) to the image point (x_j, y_j, z_j), and by equation (2)

$$\Delta t_{ij} = \frac{1}{2}\left[(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2\right]^{1/2} / V_{material} \qquad (2)$$

where $V_{material}$ is the speed of the acoustic wave in the isotropic ~~material~~ materials within the anisotropic media.

14. (currently amended) The method of Claim 12, wherein the acoustic point source is a laser, a conventional array transducer, or a phased array transducer.

15. (new) A method for imaging anisotropic media comprising:

selecting multiple points in isotropic materials within the anisotropic media, and determining an acoustic path between each selected point in the anisotropic media and a receiver position on the surface of the anisotropic media;

irradiating the anisotropic media with a point acoustic source;

scanning the anisotropic media with a receiver to map out a sound field;

determining time delays in an acoustic wave from the sound field, the time delays being based upon the acoustic paths between the selected points and a receiver position; and

incorporating the time delays into an algorithm to provide enhanced resolution and sensitivity for an image of the anisotropic media.

16. (new) The method of Claim 15, wherein the determining the acoustic path between each selected point in the anisotropic media and a receiver position on the surface of the anisotropic media comprises postulating a direct path for the wave.

17. (new) The method of Claim 15, wherein determining the acoustic path between each selected point in the anisotropic media and a receiver position further comprises adjusting the wave normal to the postulated path using a least squares minimization routine such that the wave normal is adjusted to a point where a ray trajectory intersects a sensing surface at a point where the receiver position is desired.

18. (new) The method of Claim 15, wherein the algorithm is represented by the equations (1):

$$I(x_i, y_i, z_i) = \sum_j U(x_j, y_j, z_j, \Delta t_{ij}) \qquad (1)$$

where Δt_{ij} is the round trip time delay for sound propagation from the observation point (x_i, y_i, z_i) to the image point (x_j, y_j, z_j), and by equation (2)

$$\Delta t_{ij} = \frac{1}{2}\left[(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2\right]^{1/2} / V_{material} \qquad (2)$$

where $V_{material}$ is the speed of the acoustic wave in the isotropic materials within the anisotropic media.

19. (new) The method of Claim 15, wherein the acoustic point source is a laser, a conventional array transducer, or a phased array transducer.

20. (new) The method of Claim 15, wherein the determining the time delays comprises employing ply maps, or engineering drawings.